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Remote Method Invocation

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RMI (Remote Method Invocation) is a way that a programmer, using the [Java](#) programming language and development environment, can write [object-oriented programming](#) in which [objects](#) on different computers can interact in a distributed network. RMI is the Java version of what is generally known as a remote procedure call (RPC), but with the ability to pass one or more [objects](#) along with the request. The object can include information that will change the service that is performed in the remote computer. Sun Microsystems, the inventors of Java, calls this "moving behavior." For example, when a user at a remote computer fills out an expense account, the Java program interacting with the user could communicate, using RMI, with a Java program in another computer that always had the latest policy about expense reporting. In reply, that program would send back an object and associated [method](#) information that would enable the remote computer program to screen the user's expense account data in a way that was consistent with the latest policy. The user and the company both would save time by catching mistakes early. Whenever the company policy changed, it would require a change to a program in only one computer.

Sun calls its object parameter-passing mechanism *object serialization*. An RMI request is a request to invoke the method of a remote object. The request has the same [syntax](#) as a request to invoke an object method in the same (local) computer. In general, RMI is designed to preserve the object model and its advantages across a network.

RMI is implemented as three layers:

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- A stub program in the client side of the client/server relationship, and a corresponding skeleton at the server end. The stub appears to the calling program to be the program being called for a service. (Sun uses the term *proxy* as a synonym for stub.)
- A Remote Reference Layer that can behave differently depending on the parameters passed by the calling program. For example, this layer can determine whether the request is to call a single remote service or multiple remote programs as in a multicast.
- A Transport Connection Layer, which sets up and manages the request.

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A single request travels down through the layers on one computer and up through the layers at the other end.

RMI is supplied as part of Sun Microsystem's Java Development Kit (JDK).

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- >> [Sun Microsystems has a white paper about RMI.](#)
- >> [Getting Started using RMI from Sun Microsystems provides a brief step-by-step walkthrough.](#)
- >> [The specification for RMI provides more details.](#)
- >> [TechMetrix Research offers a well-illustrated white paper, Intranet Architectures and Performances Report , that compares RMI, IIOP, DCOM, and HTTP from a network bandwidth point-of-view.](#)



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